

REMARKS

Applicants have amended their claims in order to further clarify the definition of various aspects of the present invention herein, so as to present the claims in better form for examination. Specifically, and noting that each of claims 3 and 4 recites that the "method" comprises recited steps, each of claims 3 and 4 has been amended to recite an electroless copper plating "method". Claims 5-8 have been amended in light of requirements for proper antecedent basis; and claim 9 has been amended in light of requirements for proper multiple dependency.

The restriction requirement set forth in Item 1 on page 2 of the Office Action mailed February 21, 2003, is noted. Consistent with the requirements in the Office Action mailed February 21, 2003, Applicants respectfully elect the Group II claims, drawn to an electroless copper plating machine. Reconsideration and modification of the restriction requirement, in view of the following, is respectfully requested.

That is, as can be seen in the claims as presently amended, claims 3 and 4, in addition to claims 1 and 2, recite an electroless copper plating method, comprising specific recited processing steps. In view thereof, it is respectfully submitted that claims 3 and 4, in addition to claims 1 and 2, are drawn to an electroless copper plating method.

Applicants respectfully traverse the restriction requirement as set forth by the Examiner in the Office Action mailed February 21, 2003. That is, the Examiner contends that restriction is proper between the Group I claims and the Group II claims in that "the invention II (machine) is different of the invention I (method)". It is acknowledged that the groups of claims are different, being in different statutory classes of subject matter. However, the fact that the claims are "different" does not necessarily

mean that restriction is proper. That is, it is respectfully submitted that 35 USC § 121 requires a showing by the Examiner that the different groups of claims are directed to "independent and distinct inventions", in order for restriction to be proper. It is respectfully submitted that the Examiner has not even attempted to establish that, with respect to the claims of Groups I and II, these groups define subject matter "independent and distinct".

In any event, it is respectfully submitted that the Groups I and II claims are sufficiently related, with, for example, closely corresponding searches, such that it would not be an undue burden on the Examiner to consider both the Group I claims and Group II claims in the same application. Particularly in view thereof, it is respectfully submitted that all groups of claims should be considered on the merits in the above-identified application. See Manual of Patent Examining Procedure 803.

The contention by the Examiner in the first two lines on page 3 of the Office Action mailed February 21, 2003, that the product claim will be examined along with the elected invention, is noted. At the very least, in view of the election of the present claims directed to the machine, and in view of the statement by the Examiner, consideration of the Group III claims at least with the Group II claims, is respectfully requested.

The election-of-species requirement in Item 5 on pages 3 and 4 of the Office Action mailed February 21, 2003, is noted. Consistent with the requirement by the Examiner in connection with this election-of-species requirement, Applicants respectfully elect Specie I, which is Fig. 1. It is respectfully submitted that each of claims 5-9, the machine claims, read on elected Species I, and that method claims 1-4 also read on the elected Specie I.

The contention by the Examiner that, currently, there is not a generic claim in the application, is respectfully traversed. It is respectfully submitted that, at the least, elected claim 5 is generic to Figs. 1 and 3-5; and that claim 1 is also generic to Figs. 1 and 3-5.

In view of all of the foregoing, reconsideration and withdrawal of both the restriction requirement and the election-of-species requirement as set forth in the Office Action mailed February 21, 2003; and examination of all claims presently in the application, on the merits in the above-identified application, are respectfully requested.

In any event, Applicants respectfully elect the Group II claims, which the Examiner contends includes claims 3-9, but which, as discussed previously, includes claims 5-9; and elect Species I (Fig. 1, wherein, as seen previously, claims 1-9 read thereon), with the restriction requirement being traversed.

Further examination of the above-identified application in due course, in light of the foregoing, is respectfully requested.

Attached hereto is a marked-up version of the changes made to the claims by the current Amendment. The changes are shown on the enclosed Attachment entitled "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in fees due in connection with the filing of

503.39144X00

this paper, including extension of time fees, to the Deposit Account No. 01-2135

(Case No. 503.39144X00) and please credit any excess fees to such Deposit Account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

A handwritten signature in black ink, appearing to read "William I. Solomon", with a long horizontal flourish extending to the right.

William I. Solomon
Registration No. 28,565

1300 North Seventeenth Street
Suite 1800
Arlington, VA 22209
Tel.: 703-312-6600
Fax.: 703-312-6666
WIS/sjg

VERSION WITH MARKINGS TO SHOW CHANGES MADE

3. (Amended) An electroless copper plating [machine] method using a plating solution containing copper sulfate as copper ion sources, and a copper ion complex agent, a copper ion reducing agent, and a pH conditioner, wherein said method comprises steps of adding at least one of alkaline earth metal, alkaline earth metal oxide, alkaline earth metal hydroxide, and alkaline earth metal salt (excluding sulfuric salt) into said plating solution, reacting with and precipitating sulfuric ions as an alkaline earth metal salt, measuring the concentration of sulfuric ions in said plating solution, and regulating the concentration thereof to a preset optimum concentration during electroless copper plating.

4. (Amended) An electroless copper plating [machine] method using a plating solution containing copper sulfate as copper ion sources, and a copper ion complex agent, glyoxylic acid or salt thereof as a copper ion reducing agent, and a pH conditioner, wherein said method comprises steps of adding at least one of alkaline earth metal, alkaline earth metal oxide, alkaline earth metal hydroxide, and alkaline earth metal salt (excluding sulfuric salt) into said plating solution, and reacting with and precipitating sulfuric ions or oxalic ion as an alkaline earth metal salt during electroless copper plating.

5. (Amended) An electroless copper plating machine using a plating solution containing copper sulfate as copper ion sources, and a copper ion complex agent, glyoxylic acid or salt thereof as a copper ion reducing agent, and a pH conditioner, wherein said [device] machine comprises an electroless copper plating bath for

containing an electroless copper plating solution, a reaction bath which adds at least one of alkaline earth metal, alkaline earth metal hydroxide, alkaline earth metal oxide, and alkaline earth metal salt (excluding sulfuric salt) to said copper plating solution therein to react with and precipitate sulfuric ions and oxalic ion as alkaline earth metal [salts] salt precipitate in said plating solution, and a filter unit for separating said [metallic] metal salt precipitate.

6. (Amended) An electroless copper plating machine using a plating solution containing copper sulfate as copper ion sources, and copper ion complex agent, a copper ion reducing agent, and a pH conditioner, wherein said [device] machine comprises an electroless copper plating bath for containing a copper plating solution, a reaction bath which adds at least one of alkaline earth metal, alkaline earth metal hydroxide, alkaline earth metal oxide, and alkaline earth metal salt (excluding sulfuric salt) to said copper plating solution therein to react with and precipitate sulfuric ions as an alkaline earth metal salt precipitate in said plating solution, a filter unit for separating said [metallic] metal salt precipitate, means for measuring the concentration of sulfuric ion in said plating solution[]], and means for comparing said measured concentration by a preset reference concentration and controlling the quantity of said alkaline earth metal, alkaline earth metal hydroxide, alkaline earth metal oxide, or alkaline earth metal salt (excluding sulfuric salt) to be added.

7. (Amended) An electroless copper plating machine using a plating solution containing copper sulfate as copper ion sources, and a copper ion complex agent, glyoxylic acid or salt thereof as a copper ion reducing agent, and a pH conditioner,

wherein said [device] machine comprises an electroless copper plating bath for containing a copper plating solution, a reaction bath which adds at least one of alkaline earth metal, alkaline earth metal hydroxide, alkaline earth metal oxide, and alkaline earth metal salt (excluding sulfuric salt) to said copper plating solution therein to react with and precipitate sulfuric ion as an alkaline earth metal salt precipitate in said plating solution, a filter unit for separating said alkaline earth metal salt precipitate, means for measuring at least one of the sulfuric ion concentration and the oxalic ion concentration and means for comparing at least one of said measured sulfuric and oxalic concentrations by a preset reference concentration and controlling the quantity of said alkaline earth metal, alkaline earth metal hydroxide, alkaline earth metal oxide, or alkaline earth metal salt (excluding sulfuric salt) to be added.

8. (Amended) An electroless copper plating machine using a plating solution containing metallic ions, an agent for reducing said metallic ions, and a pH conditioner, wherein said [device] machine comprises an electroless copper plating bath, a reaction bath adding a metal or a compound containing a metal to said plating solution to precipitate ions, as a metal salt precipitate, which suppress generation of said plating metal as metal salts, and [a] an ultra filtration unit for removing said metal salt precipitate.

9. (Amended) An electroless copper plating machine in accordance with any one of Claim 5 through Claim 8, wherein said filtration unit is a cross-flow [type] ultra filtration unit or a filter press [type] ultra filtration unit.